AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, listings, of claims in the application:

Listing of Claims:

1. (Currently Amended): In combination:

a roll-bowl type mill for pulverizing solid fuels for use in firing a steam generator, said pulverizing mill comprising:

a) a bowl having a predetermined diameter;

b) one or more rollers each connected to an assembly through an associated roller bearing, said assembly for holding each of said one or more rollers and for applying a preload on each of said one or more rollers, each of said one or more rollers located a predetermined distance above said bowl; and

c) one or more linear transducers mounted on said assembly to measure ~~the~~ displacement of ~~the movement~~ of said assembly when said mill is operating; and

a data acquisition system having as an input said ~~assembly movement~~ displacement of said assembly measured by said one or more linear transducers, said data acquisition system comprising:

a computing device operable to perform data collection and frequency power spectrum analysis of said ~~assembly shaft~~ displacement of said assembly to determine:

a) the diameter, D, of each of said one or more rollers by using ~~the~~ a formula:

$$D = \frac{F_b}{F_r} D_b$$

b) where, F_b is ~~the bowl~~ a frequency of said bowl and F_r is ~~the roller~~ a frequency of the roller determined by power spectrum analysis respectively, and D_b is said ~~bowl~~ predetermined diameter of said bowl.

2. (Currently Amended): The combination of claim 1 wherein said computing device further determines ~~the~~ a reduction and/or depth of wear cup, *H*, of each of said one or more rollers by using ~~the~~ a formula:

$$D_1 = 2R_1 = \frac{F_b}{F_{r1}} D_b$$

$$D_2 = 2R_2 = \frac{F_b}{F_{r2}} D_b$$

$$H = R_1 - R_2 = \frac{|F_{r2} - F_{r1}| F_b D_b}{2F_{r1}F_{r2}}$$

where, F_{r1} is ~~the~~ a dominant roller frequency peak from power spectrum analysis F_{r2} is ~~the~~ a secondary roller frequency peak from power spectrum analysis.

3. (Currently Amended): The combination of claim 2 wherein said assembly comprises a journal spring shaft and wherein said computing device further determines ~~the~~ a relative thickness ~~if~~ of said solid fuel in said mill by using ~~the~~ a formula:

$$L_1 = \beta \frac{|L| - |L_0|}{|L_0|},$$

where L is the value of ~~the~~ a displacement of said journal spring shaft measured by said one or more linear transducers, L_0 is ~~the~~ a calibrated value from said one or more transducers, and β is a coefficient.

4. (Original): The combination of claim 1 wherein said mill further comprises a wall and a means having one or more vibration sensors mounted thereon for connecting said assembly onto said mill wall and said computing device determines wear of each of said one or more roller bearings by analyzing using vibration pattern signature and/or order analysis methods the signal from each of said one or more vibration sensors.

5. (Previously Presented): The combination of claim 4 wherein said connecting means comprises a trunion shaft.

6. (Previously Presented): The combination of claim 4 wherein said connecting means comprises said assembly.

7. (Currently Amended): In combination:

a roll-bowl type mill for pulverizing solid fuels for use in firing a steam generator, said pulverizing mill comprising:

a) a bowl having a predetermined diameter;

b) one or more rollers each connected to an assembly through an associated roller bearing, said assembly for holding each of said one or more rollers and for applying a preload on each of said one or more rollers, said one or more rollers located a predetermined distance above said bowl; and

c) one or more linear transducers mounted on said assembly to measure ~~the~~ displacement of ~~the movement of~~ said assembly when said mill is operating; and

a data acquisition system having as an input said ~~assembly movement~~ displacement of said assembly measured by said one or more linear transducers, said data acquisition system comprising:

a computing device operable to perform data collection and frequency power spectrum analysis of said ~~assembly shaft~~ displacement of said assembly to determine ~~the~~ a reduction and/or depth of wear cup, *H*, of each of said one or more rollers by using ~~the~~ a formula:

$$D_1 = 2R_1 = \frac{F_b}{F_{r1}} D_b$$

$$D_2 = 2R_2 = \frac{F_b}{F_{r2}} D_b$$

$$H = R_1 - R_2 = \frac{|F_{r2} - F_{r1}| F_b D_b}{2F_{r1}F_{r2}}$$

where, F_{r1} is ~~the~~ a dominant roller frequency peak from power spectrum

analysis F_{r2} is ~~the~~ a secondary roller frequency peak from power spectrum analysis.

8. (Currently Amended): In combination:

a roll-bowl type mill for pulverizing solid fuels for use in firing a steam generator, said pulverizing mill comprising:

a) a bowl having a predetermined diameter;

b) one or more rollers each connected to an assembly through an associated roller bearing, said assembly ~~for holding~~ comprising a journal spring shaft and being operable to hold each of said one or more rollers and ~~for applying~~ to apply a preload on each of said one or more rollers, said one or more rollers located a predetermined distance above said bowl; and

c) one or more linear transducers mounted on said assembly to measure ~~the~~ a displacement of ~~the movement of~~ said assembly when said mill is operating; and

a data acquisition system having as an input said ~~assembly movement~~ displacement of said assembly measured by said one or more linear transducers, said data acquisition system comprising:

a computing device operable to perform data collection and frequency power spectrum analysis of said ~~assembly shaft~~ displacement of said assembly to determine ~~the~~ a relative thickness L_1 of said solid fuel in said mill by using ~~the~~ a formula:

$$L_1 = \beta \frac{|L| - |L_0|}{|L_0|},$$

where L is the value of ~~the~~ a displacement of said journal spring shaft measured by said one or more linear transducers, L_0 is ~~the~~ a calibrated value from said one or more transducers, and β is a coefficient.

Claims 9-14 (Canceled).

15. (Currently Amended): The combination of claim 8, wherein the mill has a

predetermined number of operational components, and wherein the computing device is operable to determine an indicator P, where $0\leq P\leq 1$, for presenting ~~the~~ availability of said mill to perform said solid fuel pulverizing by using ~~the~~ a formula:

$$P = \sum_{1}^{n} w_i p_i$$

where w_i is ~~the~~ a weight factor, $\sum w_i = 1$; and p_i is ~~the~~ availability of each individual operational component of said predetermined number of components and $0 \leq p_i \leq 1$.

16, (Previously Presented): The combination of claim 15, wherein the availabilities of the predetermined operational components comprises P_1, which relates to the thickness of the solid fuel and is equal to $1-L_1$.

17. (Currently Amended): The combination of claim 16, wherein the availabilities of the predetermined operational components further comprises:

P_2, which relates to a pressure difference across the bowl and is determined from ~~the~~ a formula:

$$P_2 = 1 - \alpha_2 \frac{|P| - |P_0|}{|P_0|}$$

where P is a measured pressure difference across the bowl, P_0 is a nominal pressure difference value and α_2 is a coefficient.